At higher angles only scattering was recorded, decreasing with increasing angle as is described by the Lorentz-polarization factor. The result was a diffraction peak measured at an angle which depended on both the size of the screened part of the incident beam and the disorientation of the diffractometer caused by the displacement of the sample. This phenomenon is nicely illustrated by Brindley and Simonton's Figure 2 where, starting from a displacement of 0.86 mm, each diffraction curve is formed by cutting off the lowest-angle part of the previous curve.

We conclude that Brindley and Simonton (1984) measured neither long spacings caused by total reflection nor a displacement of them, but rather artificial peaks due to misalignment of the diffractometer. It is therefore not surprising that they recorded very similar results for different types of materials.

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Netherlands Institute for Sea Research SJERRY J. VAN DER GAAST
J. H. FRED JANSEN
P.O. Box 59
1790 AB Den Burg, Texel
The Netherlands

REFERENCE

Brindley, G. W. and Simonton, T. C. (1984) Apparent long spacings from clay-water gels, glasses, and crystalline materials due to total reflectance of X-rays: *Clays & Clay Minerals* **32,** 235–237.

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APPARENT LONG SPACINGS FROM CLAY-WATER GELS, GLASSES, AND CRYSTALLINE MATERIALS DUE TO TOTAL REFLECTION OF X-RAYS: REPLY TO COMMENT

Key Words—Diffractometer alignment, Long spacings, Reflection, X-ray powder diffraction.

van der Gaast and Jansen (1985) made some interesting comments as to the cause of apparent long spacings from clay-water gels and other materials; however, they misunderstood the intent of the note by Brindley and Simonton (1984). In no way did we attempt to measure true long spacings by total reflection of X-rays. The purpose of the note was to warn the reader that apparent long spacings, or spurious peaks, on the order of 150 Å *could* be observed *if* the surface of gel smears, single mica flakes, and other materials was raised sufficiently above the axis of the goniometer. Moreover, the ramifications of sample displacement above the goniometer axis were discussed as they related to coefficient of variation calculations for interstratified clay minerals.

We were aware of the fact that the incident X-ray beam was screened by the elevated sample and illustrated the effect in Figure 2. The extrapolation of data in Figure 1 was given as evidence to support the theory that the apparent long spacings may be due to reflection of X-rays which occurs between 0.33° and 0.50°2θ.

The only valid point of contention that van der Gaast and Jansen posed was that the apparent long spacings observed may not have been due to reflection of X-rays, but instead were artifacts produced by the screening of the incident beam. However, this is a minor point. To reiterate, the purpose of the Brindley and Simonton (1984) note was to warn investigators that displacement of the sample surface above the goniometer axis could give spurious peaks or shift true crystalline reflections from their correct positions.

Materials Research Laboratory T. C. SIMONTON
Pennsylvania State University
University Park, Pennsylvania 16802

REFERENCES

Brindley, G. W. and Simonton, T. C. (1984) Apparent long spacings from clay-water gels, glasses, and crystalline materials due to total reflection of X-rays: *Clays & Clay Minerals* **32,** 235–237.

van der Gaast, S. J. and Jansen, J. H. F. (1985) Apparent long spacings from clay-water gels, glasses, and crystalline materials due to total reflection of X-rays: a comment: *Clays & Clay Minerals* **33,** 471–472.

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